

STEREO TAPECORDER

TC-378



Owner's instruction manual

Before operating, read this manual to become familiar with all features and functions. Keep this manual handy for future reference.

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The instructions for the unit sold at Post Exchanges are written in English.

Mode d'emploi

Avant toute opération, lisez soigneusement ce mode d'emploi pour devenir familier avec les caractéristiques et les fonctions. Conservez ce manuel à portée de main pour toute référence ultérieure.

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Les instructions pour l'appareil destiné au "Post Exchange" sont décrites seulement en anglais.

Bedienungsanleitung

Lesen Sie bitte vor Inbetriebnahme diese Bedienungsanleitung durch, damit mit aller besonderen Einrichtungen und Funktionen vertraut zu werden. Bewahren Sie diese Anleitung, um später jederzeit darin nachschlagen zu können.

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Die Bedienungsanleitung für das Gerät, das bei der Marketenderei verkauft ist, auf Englisch geschrieben ist.

WARNING

- To avoid electrical shock, do not open the cabinet except as instructed in manual. Refer servicing to qualified personnel only.
- To prevent fire or shock hazard, do not expose the set to rain or moisture.

AVERTISSEMENT

- Pour éviter toute électrocution, ne pas ouvrir le coffret sauf, conformément au mode d'emploi. Confier l'entretien uniquement à un personnel qualifié.
- Pour éviter tout danger d'incendie ou d'électrocution, ne pas exposer l'appareil à la pluie ou à l'humidité.

VORSICHT

- Um einen elektrischen Schlag zu vermeiden, darf das Gehäuse nicht geöffnet werden. Wartungsarbeiten sollten nur von Fachmann vorgenommen werden.
- Um einen elektrischen Schlag oder Brandgefahr zu vermeiden, darf das Gerät weder Regen noch Feuchtigkeit ausgesetzt werden.

FREQUENT CLEANING OF HEADS RECOMMENDED

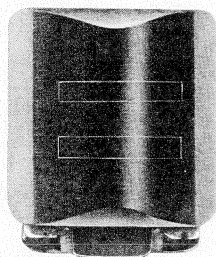
- Keep the heads and all surfaces over which the tape travels clean in order to assure optimum performance. For cleaning information, refer to "MAINTENANCE" on page 11.

NETTOYAGE FREQUENT DES TÊTES RECOMMANDÉ

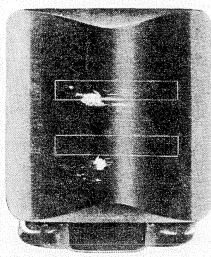
- Pour obtenir des performances optimales du magnétophone, maintenir les têtes dans un parfait état de propreté. Pour les instructions concernant le nettoyage, se référer à "ENTRETIEN", page 19.

HÄUFIGES REINIGEN DER TONKÖPFE EMPFOHLEN

- Halten Sie die Tonköpfe und alle Oberflächen, mit denen das Tonband in Berührung kommt, sauber, um besten Betrieb sicherzustellen. Beziehen Sie sich für Reinigungsanweisungen auf den Abschnitt „WARTUNG UND PFLEGE“ auf Seite 27.

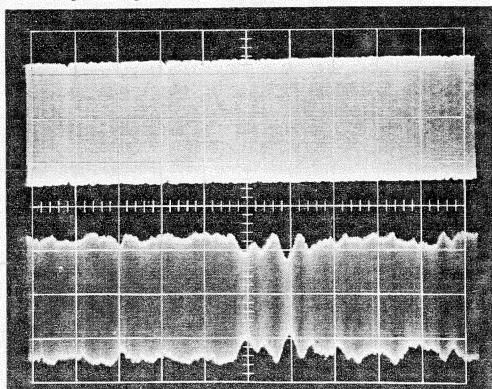


Clean head
Tête propre
Sauberer Tonkopf



Dirty head
Tête encrassée
Schmutziger Tonkopf

Playback waveform at 10 kHz
Lecture d'un signal à 10 kHz
Wiedergabe-Signal bei 10 kHz



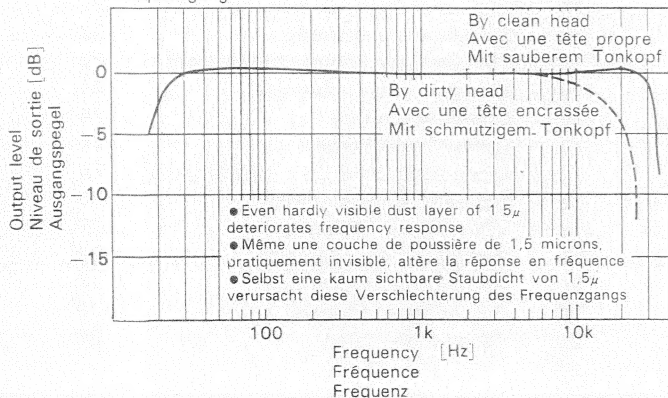
By clean head
Avec une tête propre
Mit sauberem Tonkopf

By dirty head
The output level fluctuates.

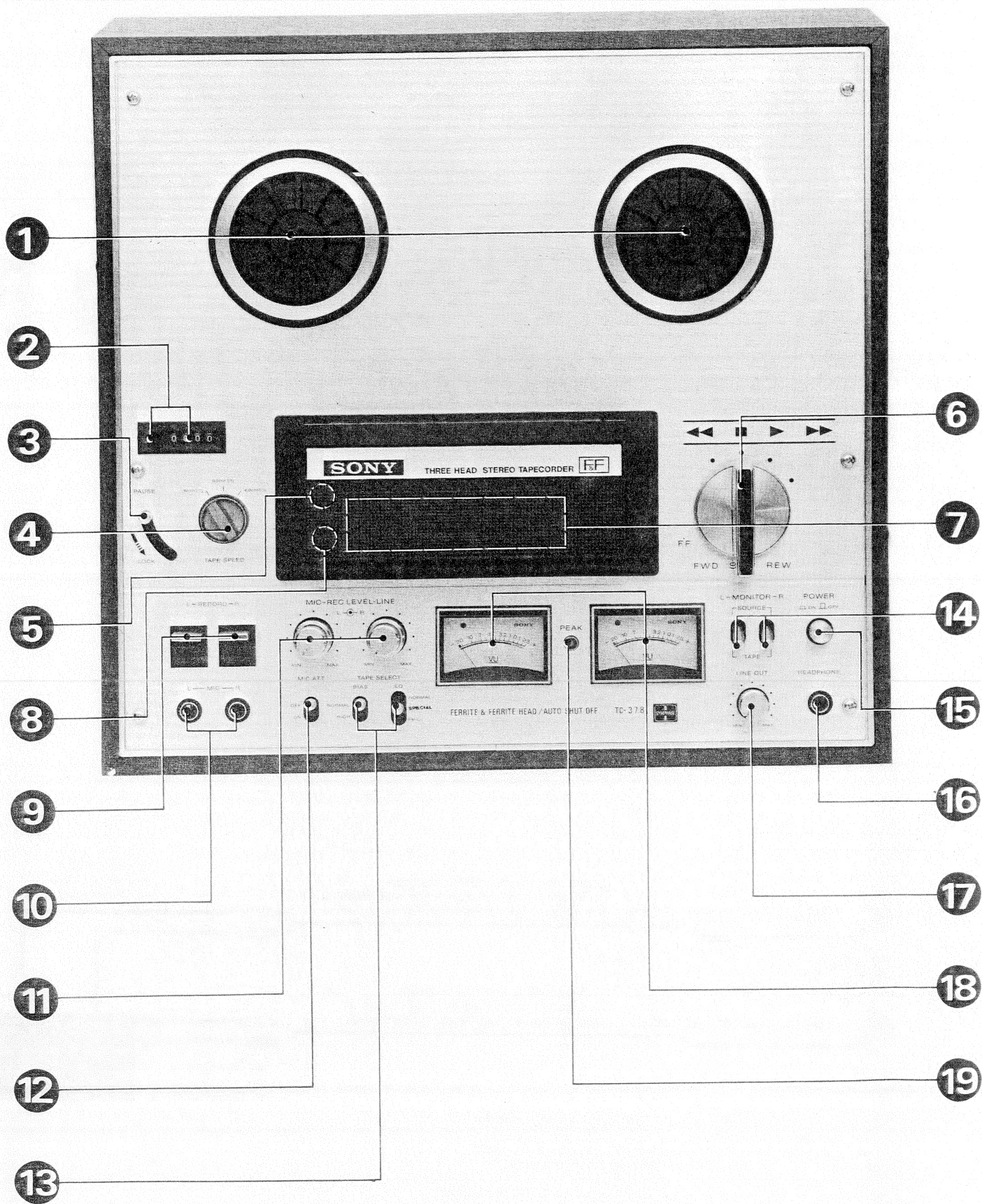
Avec une tête encrassée
Il y a une fluctuation du niveau de sortie.

Mit schmutzigem Tonkopf
Der Ausgangspegel schwankt.

Frequency response
Réponse en fréquence
Frequenzgang



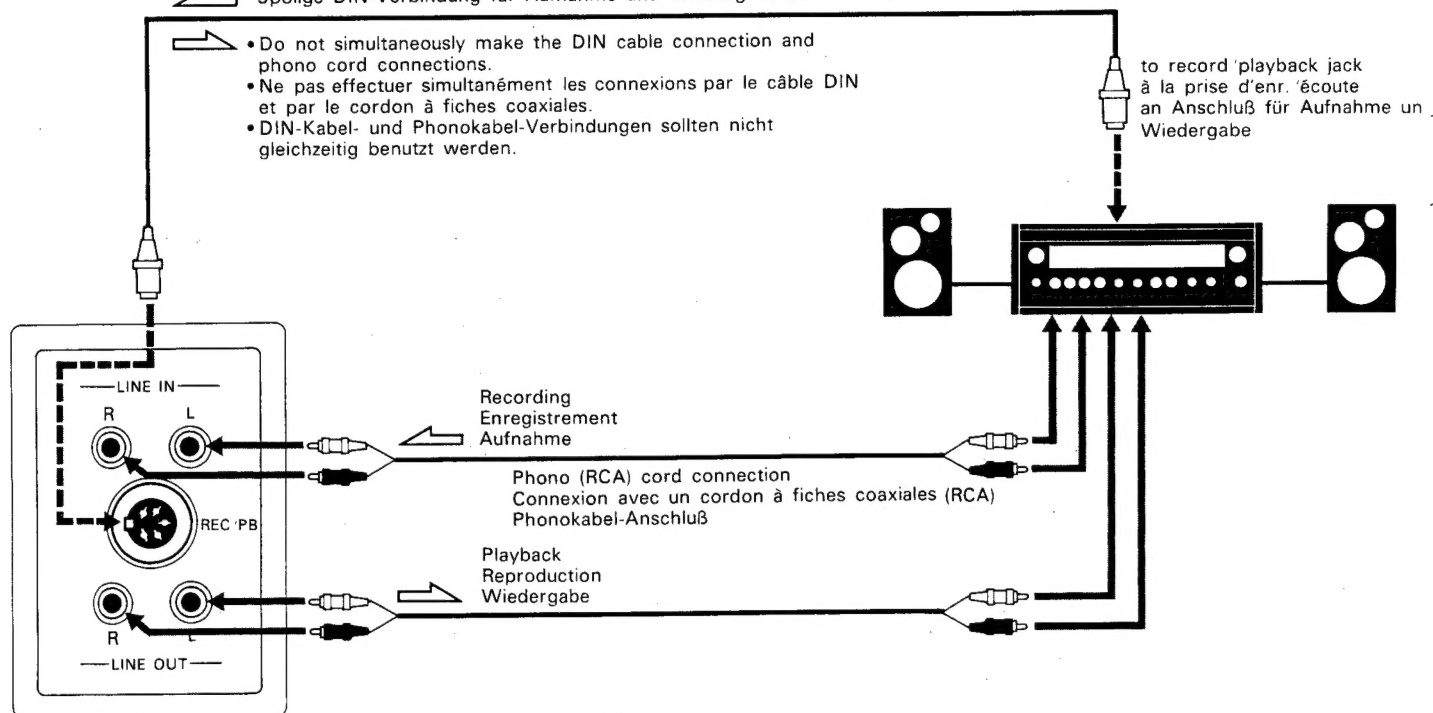
LOCATION OF CONTROLS/EMPLACEMENT DES COMMANDES/
LAGE DER BEDIENUNGSELEMENTE



CONNECTIONS/CONNEXIONS/ANSCHLÜSSE

Amplifier connection
Connexion de l'amplificateur
Anschließen an einen Verstärker

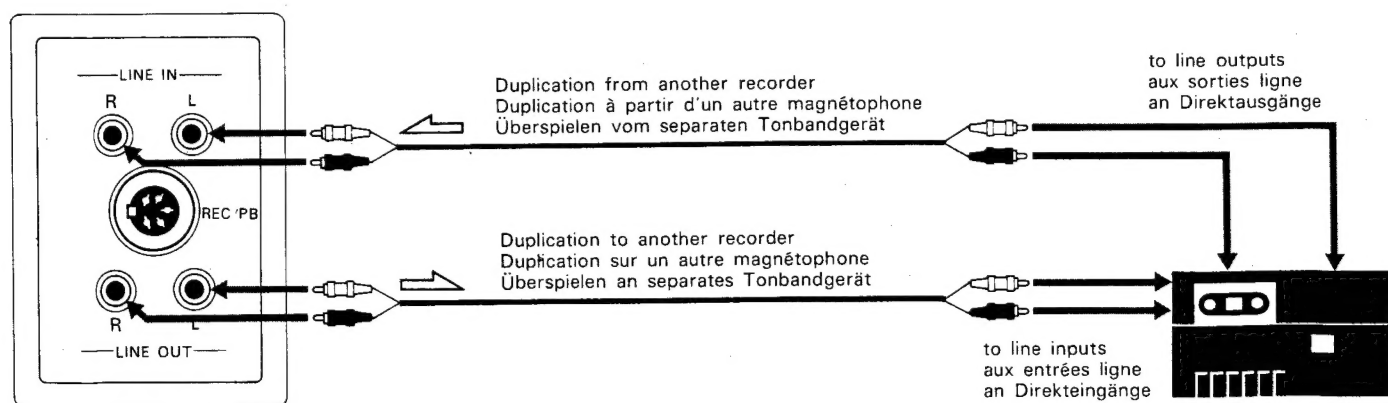
Single DIN cable connection for record/playback
Connexion par un seul câble DIN pour l'enregistrement/écoute
5polige DIN-Verbindung für Aufnahme und Wiedergabe über ein Kabel




- Do not simultaneously make the DIN cable connection and phono cord connections.
- Ne pas effectuer simultanément les connexions par le câble DIN et par le cordon à fiches coaxiales.
- DIN-Kabel- und Phonokabel-Verbindungen sollten nicht gleichzeitig benutzt werden.

- Red plugs for right channels, remaining plugs for left channels
- Fiches rouges pour les canaux droits, les autres pour les canaux gauches
- Die roten Stecker für die Verbindungen des rechten Kanals und die übrigen für die des linken.

Tape duplication connection
Connexion pour la duplication de bande
Anschluß zum Überspielen von Bändern




- To directly connect both recorder DIN jacks, a DIN cable for tape duplication is required.
- Pour raccorder directement les prises DIN des deux magnétophones, utiliser un câble DIN spécialement conçu pour la duplication de bande.
- Wenn die beiden Geräte über die DIN-Anschlüsse direkt verbunden sind, muß zum Überspielen spezielles DIN-Kabel verwendet werden.

- Turn off the amplifier while making connections.
- Insert the cable connectors completely into the jack. Loose connections may cause hum and noise.
- As the safety earth connection is made through the 3-pin power cord, earth connection on the terminal [] is not necessary.
- Connect the recorder to ac outlet with supplied power cord; first plug the cord into the recorder AC INput, then into wall outlet.

Amplifier Connection

There are two possible ways to connect the recorder to an amplifier, by phono (RCA) jacks using the supplied connecting cords or by a single 5-pin DIN connecting cable. Note the following points.


- If your amplifier has phono-type tape inputs and recording outputs, the phono cord connections are recommended, rather than the DIN jack connection, since this will result in better S/N ratio.
- The phono-cord connections allow monitoring of tape/source signals through speakers and recorder HEADPHONES jack. But, with DIN jack connection, monitoring is possible only through recorder HEADPHONES jack.
- Connection between amplifier record/playback (DIN) jack and recorder phono jacks is not recommended, since their input and output sensitivity and impedance are not correctly matched.
- When recording through recorder DIN jack, be sure to disconnect any input source from the MIC jacks. If both DIN and MIC jacks are engaged, the DIN inputs are automatically cut off, and only mic signals will be recorded. From the same reason, mixing of DIN input signals with mic signals is not possible.
- When recording through the DIN jack, be sure to set the MIC ATT switch to OFF. Otherwise the input level is reduced.

- Couper l'alimentation de l'amplificateur avant de faire les connexions.
- Insérer à fond les fiches des cordons dans les prises. Des raccordements lâches peuvent être à l'origine de bruit et de bourdonnement.
- Le cordon d'alimentation équipé d'une prise à trois broches assure la mise à la terre de sécurité. Il n'est pas nécessaire de relier la borne à une prise de terre [].
- Brancher le magnétophone à une prise du secteur avec le cordon d'alimentation fourni: raccorder d'abord l'entrée d'alimentation CA du magnétophone, puis brancher sur une prise du secteur.

Connexion de l'amplificateur

Il y a deux possibilités de brancher le magnétophone sur un amplificateur, par les prises coaxiales (RCA) à l'aide des cordons de raccord fournis ou du cordon de raccord DIN à 5 broches. Noter les points suivants.

- Si l'amplificateur a des entrées de magnétophone, et des sorties d'enregistrement de type coaxial, un raccordement par les prises coaxiales est recommandé, pour obtenir un meilleur rapport signal sur bruit à l'enregistrement.
- Pendant l'enregistrement les raccordements par le cordon de raccord pour prises coaxiales autorisent une écoute en relais du programme d'enregistrement/écoute avec les haut-parleurs, ou la prise de casque du magnétophone. Avec une connexion par la prise DIN, seule l'écoute par la prise de casque du magnétophone est possible.
- La sensibilité et l'impédance des entrées et sorties de la prise DIN de l'amplificateur et des prises coaxiales du magnétophone ne se correspondent pas. Eviter donc une telle connexion.
- Pour un enregistrement par la prise DIN du magnétophone, s'assurer qu'il n'y a aucune connexion aux prises de microphone [MIC]. Dans le cas d'un raccord simultané aux prises DIN et microphone, l'entrée DIN est coupée, et seuls les signaux microphoniques sont enregistrés. Pour la même raison, le mélange des signaux d'entrée DIN avec des signaux microphoniques n'est pas possible.
- Pour un enregistrement par la prise DIN, s'assurer de placer l'interrupteur [MIC ATT] à OFF. Sinon, le niveau d'entrée est réduit.

- Schalten Sie während des Anschließens bitte den Verstärker aus.
- Schieben Sie die Kabelstecker vollständig in die Buchsen. Lockere Anschlüsse können Brummen und Rauschen verursachen.
- Da die Schutzterdung über das dreidradige Netzkabel hergestellt wird, ist ein Erdschluß an der Klemme [] nicht erforderlich.
- Schließen Sie den Rekorder mit dem mitgelieferten Netzkabel an eine Steckdose an. Schließen Sie das Kabel erst an die Netzanschluß [AC IN] des Rekorders und dann an die Steckdose an.

Verstärkeranschluß

Für den Anschluß des Rekorders an einen Verstärker gibt es zwei Möglichkeiten; über Phonobuchsen (RCA-Typ) mit den mitgelieferten Kabeln oder über ein fünfporiges DIN-Kabel. Beachten Sie bitte die folgenden Punkte.

- Wenn Ihr Verstärker Phonobuchsen für die Aufnahme- und Wiedergabeanschlüsse eines Tonbandgerätes besitzt, so wird Anschluß über die mitgelieferten Phono-Kabel anstatt über DIN-Kabel empfohlen, da hierdurch ein besserer Signal-Rauschabstand erreicht wird.
- Beim Anschluß an die Phonobuchsen ist es möglich, ein Programm bei der Aufnahme über Lautsprecher und Kopfhöreranschluß des Rekorders mitzuhören. Bei Verwendung des DIN-Anschlusses ist ein Mithören der Aufnahme nur über den Kopfhöreranschluß des Rekorders möglich.
- Eine Verbindung zwischen des DIN-Anschlusses für Aufnahme/Wiedergabe eines Verstärkers und den Phono-Anschlüssen des Rekorders wird nicht empfohlen, da in diesem Fall die Empfindlichkeiten und die Impedanzen der Ein- und Ausgänge nicht richtig angepaßt sind.
- Wenn Sie über den DIN-Anschluß des Rekorders aufnehmen wollen, achten Sie bitte darauf, daß alle Stecker von den Mikrofonanschlüssen abgezogen sind, da sonst die DIN-Eingänge automatisch abgeschaltet sind und nur die Mikrofon-signale aufgenommen werden. Aus diesem Grunde können Sie die Signale der DIN-Eingänge auch nicht mit Mikrofon-signalen mischen.
- Achten Sie bei Aufnahme über die DIN-Anschluß darauf, daß der Mikrofondämpfungsschalter [MIC ATT] auf OFF gestellt ist, da sonst der Eingangspegel verringert wird.

PRECAUTIONS

Safety

- Before operating, check that the voltage selector is set to your local power source.
- Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified personnel before operating it any further.
- Unplug the set from the wall outlet if it is not to be used for an extended period of time.
- To disconnect the cord, pull it out with the plug. Never pull the cord itself.

Installation

- Good air circulation is essential to prevent internal heat build-up. Place the set in a location with adequate air circulation. Do not place the set in an enclosed cabinet that would block the ventilation holes on the back.
- Do not install the set in a location near heat sources such as radiators or airducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

Operation

- Thread the tape without slack. If there is slack in the tape, the function selector does not lock.
- The record/playback (DIN) inputs are common to the microphone signal path. So if you connect the input source to the REC/PB jack, use MIC REC LEVEL controls. If the MIC and REC/PB jacks are simultaneously connected, the REC/PB input is automatically cut off.
- The microphone inputs and line inputs can be used simultaneously for mixing. To record only through microphone or line inputs, turn the unused REC LEVEL controls (MIC or LINE) fully to MIN.
- Usually set the LINE OUT level control at MAX.

If you have any question or problem about your set, consult your nearest Sony dealer.

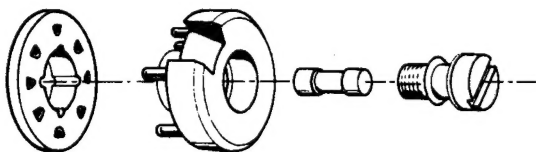
VOLTAGE ADAPTATION

Before connecting the TC-378 to the power source, check that the voltage selector setting is correct for your power supply. The voltage selector is located in the side. If the selector must be reset, change the setting as follows.

WARNING: Check that the ac power cord is disconnected.

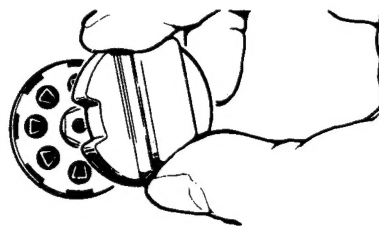
There are two types in the voltage selector.

Type 1 operates on either 110, 127, 220 or 240 V ac.



1. Turn the fuse-holder cap counterclockwise using a coin and remove it.
2. Pull out the round voltage selector and reposition so that proper voltage figure appears in the selector cutout.
3. Reinsert the fuse-holder.

Type 2 operates on either 100, 110, 120, 127, 220 or 240 V ac.



1. Pull out the three-pin voltage selector.
2. Reposition so that proper voltage figure appears in the selector cutout.

As for the type 2, the set available in Asia is fixed at 60 Hz, and the set available in Europe is fixed at 50 Hz. To change the operating frequency, refer to the page 12.

FUNCTION OF CONTROLS

Fold out the page 3 for referring to the location of controls.

① Reel spindles with reel locks

② Tape counter and reset button

Use the counter for indexing tape contents. Once a reel is threaded, set the counter to [0000] by pushing the reset button. The figures on the counter change as the tape passes. Make a note of the figures and the recorded program for later reference.

③ PAUSE lever

To pause momentarily in playback or recording (to eliminate undesired portions), slide down the PAUSE lever.

Tape will stop (tape-and-head contact remains). To restart, move it up. This lever is also used for proper timing of the recording.

- When the function selector is turned to ■ (STOP), the PAUSE lever will also be released.

④ Tape speed selector

7 1/2 ips (19 cm/s) and 3 3/4 ips (9.5 cm/s) are ideal for recording music when best sound quality is desired. 1 7/8 ips (4.8 cm/s) is ideal for speech, especially when longer recording time is desired.

Change the speed only in stop mode.

⑤ Tape tension regulator

The guide pin quickly responds to any subtle change of tape tension so that a smooth, even flow of tape past the head assembly is assured.

6 Function selector

This selector is locked at ◀◀, ▶ or ▶▶ only when the tape is threaded.

- ◀◀ (REW) ... to rewind the tape
- (STOP) ... to stop the tape
- ▶ (FWD) ... to start the tape in either record or playback mode
- ▶▶ (FF) ... for fast forward tape motion

7 Head portion

Always keep this section clean for optimum performance. Refer to page 11.

8 Automatic Shut-off lever

When the tape is threaded, the tape contacts the lever and holds it in operating position. If the tape runs out or breaks, the lever will fall forward and activate the shut-off mechanism which stops the tape transport and returns the function selector to ■ (STOP).

9 RECORD levers

While holding these levers down, set the function selector to ▶ position to start recording.

10 MIC input jacks

Any high-quality low-impedance microphone equipped with a phone plug may be used. If your microphone is equipped with a mini plug, a plug adaptor for converting to phone plug is required.

11 REC LEVEL controls

Adjust the record input levels of the LINE IN and MIC jacks. MIC controls for MIC and REC/PB jacks. LINE controls for LINE IN jacks. The outer knob is for L channel and the inner for R channel. Turn the unused controls fully to MIN.

12 MIC ATTenuation switch

Usually this switch should be at OFF. When recording an excessively high level sound source with a microphone, use the switch for easier level adjustment, to prevent overloading the mic amp of the recorder; ON position attenuates 20 dB.

13 TAPE SELECT switches

Select the correct equalization characteristics and optimum bias current for the tape used.

For recording, adjust both BIAS and EQ switches and for playback, EQ switch only.

The list shows our recommendation settings for commercially available tapes. The setting may be changed to your preference. Sony tapes are adjusted to provide optimum tape characteristics at the recommended positions.

Tapes	BIAS	EQ
SONY PR other regular tapes	NORMAL	NORMAL
SONY SLH MAXELL LNE 35 BASF 35 LH SCOTCH 212, CLASSIC TDK SD 150, AUDUA AGFA PE 36 other Low-noise High-output tapes	NORMAL	SPECIAL
Sony Ferri-Chrome Tape	NORMAL	Fe-Cr
SCOTCH 206, 218	HIGH	NORMAL

14 MONITOR selectors

For playback of tapes, set the selectors to TAPE. While recording, the TAPE position monitors the recorded sounds and SOURCE position monitors the sounds to be recorded (source material). Record level adjustment can be made with these selectors at SOURCE.

15 POWER switch

16 HEADPHONES jack

Connect 8-ohm headphones for record monitoring. Headphone level is fixed in both record and playback modes.

17 LINE OUT level control

Use the control to match the recorder output level with other sources connected to the amplifier.

FM or Phono mode is recommended as a reference point. While adjusting, do not change the volume control of the amplifier. At MAX, the output level is rated 0.775 V (0 dB) and at MIN, 77.5 mV (-20 dB). The control does not correspond to the VU meters.

Generally set this control at MAX.

The output level of the REC/PB jack is fixed at 0.775 V without relation to the LINE OUT control.

18 VU meters

The meters show the input record level with the MONITOR selectors set at SOURCE, and show the recorded level with the selectors set at TAPE. In either case, 0 VU reading corresponds to 0.775 V.

19 PEAK level indicator

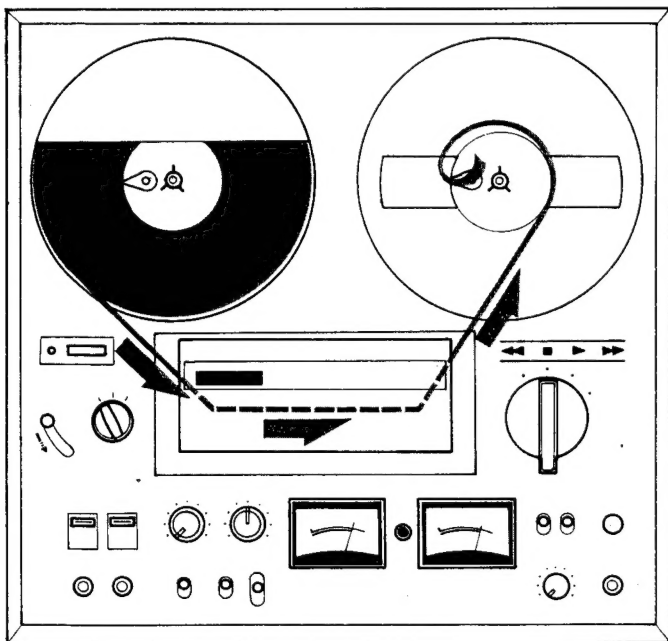
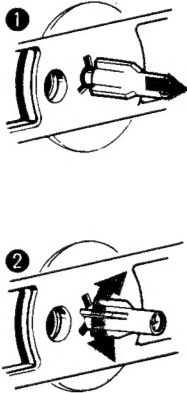
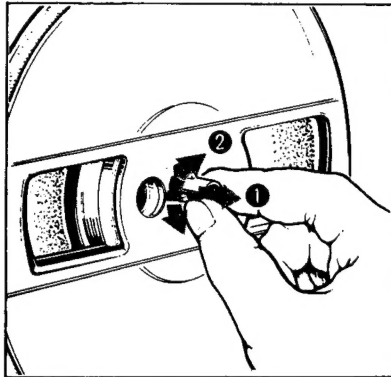
The indicator flashes whenever transient peaks occur. Since it registers over-modulation much more quickly than the VU meters, the impulses which are not shown in the meters can be avoided by readjusting the levels.

Note that the PEAK level indicator illuminates whenever the input signal connected to the LINE IN, REC/PB and MIC jacks passes the point of distortion, but does not indicate tape saturation in playback.

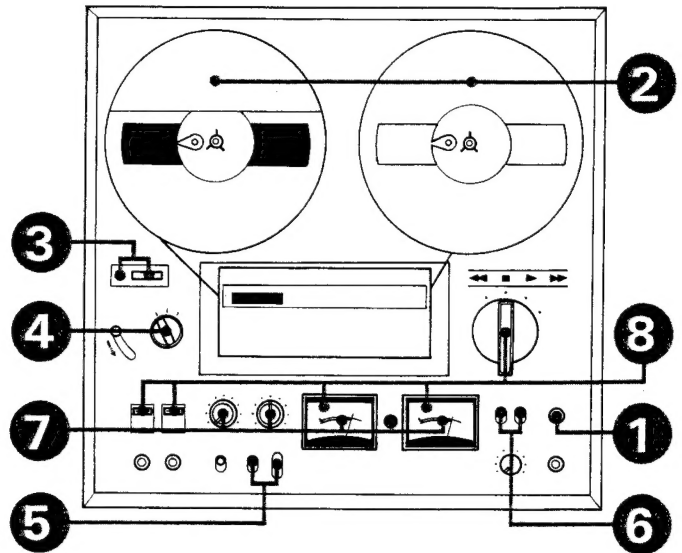
TAPE THREADING

Use the same kind of reels (size and hub diameter) for both supply and take-up.

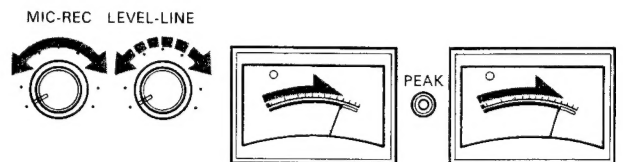
1. Secure the reels.
2. Pass the tape.
3. Wrap the tape around the hub of the right reel or insert the end of the tape into the reel slot.
4. Rotate the reels a few times by hand until the slack in the tape is eliminated.



STEREO RECORDING



- 1 Turn on the recorder and the source equipment.
- 2 Thread a tape. Ensure that both take-up and supply reels are placed with side "1" up.
- 3 Set the counter to "0000".
- 4 Set the TAPE SPEED selector as desired.
- 5 Set the BIAS and EQ selectors according to the tape used.
- 6 Set the MONITOR selectors to SOURCE.
- 7 Temporarily reproduce the program to be recorded, and adjust the record level with respective MIC or LINE REC LEVEL controls while watching the VU meters and PEAK level indicator. Be sure to turn the unused level control fully to MIN. For microphone recording, use the MIC ATT switch if necessary.



- 8 While holding the RECORD levers down, set the function selector at ►.
- Now recording on tracks 1 and 3 starts.
- When recording completes, return the function selector to ■. To record on side 2 (tracks 4 and 2), do not rewind the tape, but reverse reel positions.

Record Level Adjustment

Generally, record level should be adjusted so that the pointers of the VU meters deflect as fully as possible with flickering of the PEAK level indicator. If indicator flashes continuously, reduce the level slightly. You should be aware when recording programs which contain short, strong impulses such as live programming. Headphone monitoring helps to avoid failure. Use the MIC ATT switch if necessary.

High record level is recommended to produce noise-free tapes, but overloaded and distorted tapes could result if the level is too high.

Do not change the record level once the recording starts, as this will easily be audible during playback, especially when the stereo balance is changed. If readjustment becomes necessary, it is advisable to wait until a break or a pause between movements occurs or a soloist has finished his turn.

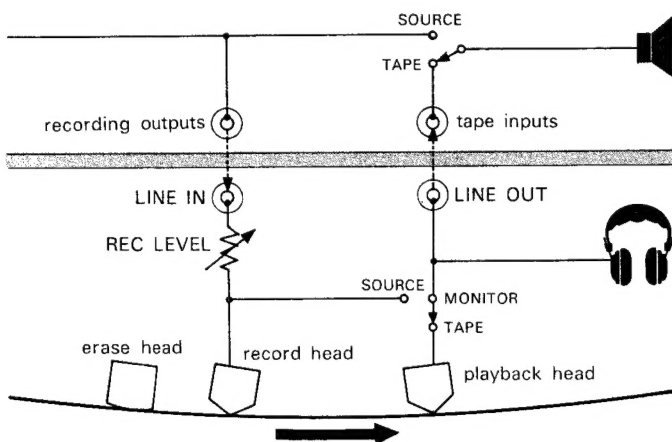
Record Monitoring

As this recorder has record and playback heads separately, instantaneous tape-source comparison is possible with the MONITOR selectors while recording.

at SOURCE: sound from source to be recorded is heard

at TAPE: sound from tape just recorded is heard

If the amplifier has a tape-monitor selector and connection is made through recorder LINE IN and LINE OUT jacks, tape/source comparison is also possible with the amplifier monitor selector. In this case, the MONITOR selectors on the recorder should be set at TAPE.



● While recording with a microphone, headphone monitoring is advisable because speaker monitoring may cause a howling effect.

Note on Recording

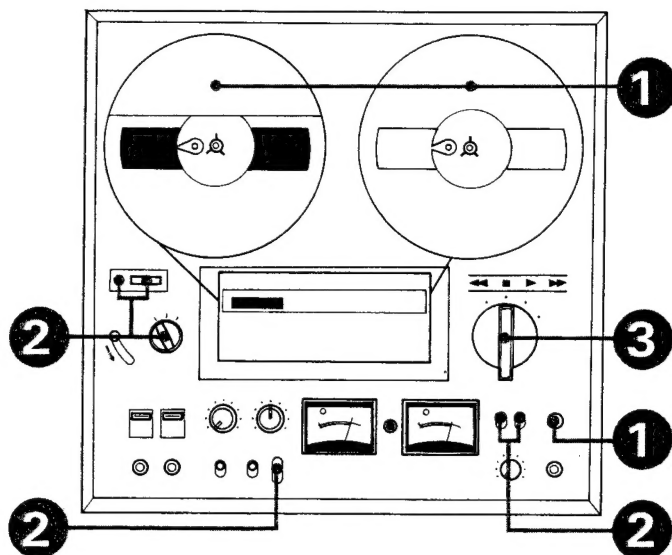
● If you re-record on a previously recorded tape, either erase the tape fully, or to control the tape motion, use the PAUSE lever only, because a tiny portion of the previously recorded sound will not be erased when the stop- and start-functions are used.

Erasing

When recording starts, any pre-recorded material will be erased. To erase without new recording, proceed the recording steps without feeding the input signals i.e. turn the MIC and LINE REC LEVEL controls fully to MIN or disconnect all inputs.

● For quick erasure, use a commercially available erasure.

STEREO PLAYBACK



① Turn on the recorder and thread a tape.

② Set the controls.

● Tape counter to "0000".

● TAPE SPEED selector to match the prerecorded tape

● EQ selector as listed on page 7.

● MONITOR selectors to TAPE

③ Turn the function selector to ►.

Playback will begin.

④ Adjust sound level and tone quality with amplifier controls.

Notes on Playback

● In playback, the EQ selector works only to compensate the output level differences between the type of tape, and has no effect upon anything else.

MONO RECORDING AND PLAYBACK

Proceed in the following order.

At the end of each track, do not rewind the tape but reverse reel positions.

● In mono playback, set the amplifier mono selector to MONO and reduce the unused left or right channel volume control.

Track sequence	Reel side	Operating track	For recording		
			RECORD lever	MIC or LINE level controls	Input connection
Track ①	①				Left input
Track ④	②				
Track ③	①				Right input
Track ②	②				

SPECIAL RECORDINGS

Mic-and-Line Mixing

Connect microphones to MIC jacks and line source to LINE IN jacks (with REC/PB jack mic mixing cannot be done). While listening through headphones, adjust the mixing level by turning the respective REC LEVEL controls of MIC-L·R, LINE-L·R. The VU meters indicate the composite record level of line and microphone inputs. Fade-in/fade-out techniques will provide more creative and professional recordings.

Sound-on-Sound Recording

The TC-378 can make a composite recording from the left channel to the right channel and vice versa. This enables you to record a duet with your favorite singer or create other special effects.

Sound-on-Sound recording on the right channel [L→R]

1. Record the basic program on the track 1 of the left channel according to "MONO RECORDING AND PLAYBACK", and rewind the tape to the beginning.
2. Connect the L LINE OUT jack and R LINE IN jack by using the supplied connecting cord.
Be sure to use the plugs of the same color at both ends of the connecting cord.
3. Connect a microphone into the R MIC jack.
4. Connect stereo headphones for monitoring.
5. Set the L MONITOR selector to TAPE and the R MONITOR selector to SOURCE. Set the LINE OUT level controls to MAX.
6. Adjust the record level: Temporarily play back the tape and adjust the R LINE and R MIC REC LEVEL controls while watching the right VU meter.
7. Rewind the tape to the beginning.
8. While depressing the R RECORD button, set the function selector at ►. Recording will begin.
Through the left headphone, the playback of the basic recording on the track 1 is heard; through the right headphone, the composite recording on the track 3 is heard.
9. When recording is finished, rewind the tape to the beginning. To play back track 3, set the R MONITOR selector to TAPE and L MONITOR selector to SOURCE.

For recording on the left channel [R→L], use the R LINE OUT jack and L LINE IN jack. Other recording procedures are the same as described above except for the channel used.

Echo Recording (more resonant microphone recording)

Stereo echo recording

1. Insert two microphones into the MIC jacks.
2. Turn the L LINE, R LINE, L MIC and R MIC REC LEVEL controls fully counterclockwise.
3. Connect the LINE IN jacks by using the supplied connecting cord.
4. Insert stereo headphones into the HEADPHONES jack.
5. Set the MONITOR selectors to TAPE.
6. While depressing the RECORD buttons, set the function selector at ► and start recording.
7. While listening through the headphones, adjust the L and R MIC controls. Then slowly turn the L and R LINE controls clockwise for desired echo through the microphone input source. Be careful not to excessively increase the record volume. Otherwise oscillation may occur as a rumbling sound.
8. Rewind the tape to the beginning.
Now, echo recording preparation is complete. Start a formal recording. In this case, disconnect the stereo headphones, since headphone monitoring may disturb your tempo because of the time-lag between original sound and headphone sound.

Monophonic echo recording

Recording procedure is almost the same as described above except for the use of one microphone.

MAINTENANCE

Cleaning Heads and Tape Path

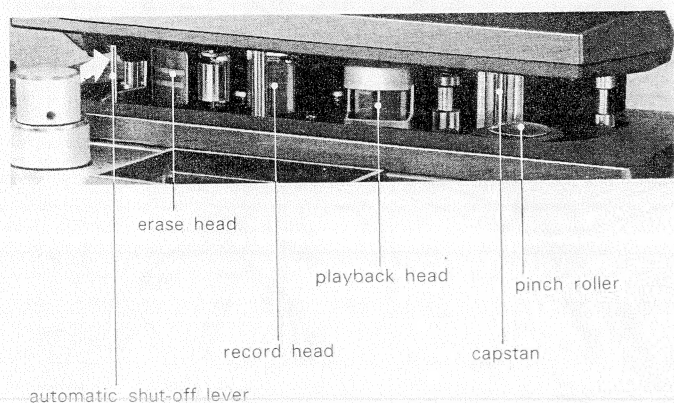
Generally cleaning heads after every 10 hours operation will be sufficient. However, all surfaces over which tape travels should be cleaned before making high quality recordings.

Dirty heads and tape path will cause:

- Loss of high frequency response which results in poor sound quality
- Loss of sound volume in recording and playback
- Dropout
- Unsatisfactory results in tape erasing
- Increase of wow and flutter

Take the supplied head cleaning tip or a cotton swab and wipe the heads and tape path. If the deposits are difficult to remove, moisten the tip with denatured alcohol or head cleaning solution.

- For easier cleaning of the pinch roller, push in the automatic shut-off lever and set the function selector to ►. For the capstan, set the function selector to ►►.
- Be careful not to scratch the head surface.
- Be careful not to jam the tip between pinch roller and capstan.



Demagnetizing Heads

Residual magnetism will gradually build up on the heads through continuous use and cause an increase of tape noise while recording, and erasure of high frequencies or hiss build-up on your prerecorded tape. The heads and metallic parts of the tape path should be demagnetized after 20-30 hours of operation with a commercially available head demagnetizer.

Before proceeding, be sure to turn off the recorder.

Cleaning Cabinet

Periodically clean the cabinet, panel and knobs with a soft cloth. If finger prints, food and beverage stains, etc. are difficult to remove, use a cloth barely moistened with a mild soap solution. Do not use any type of scouring powder, abrasive pad, or solvent.

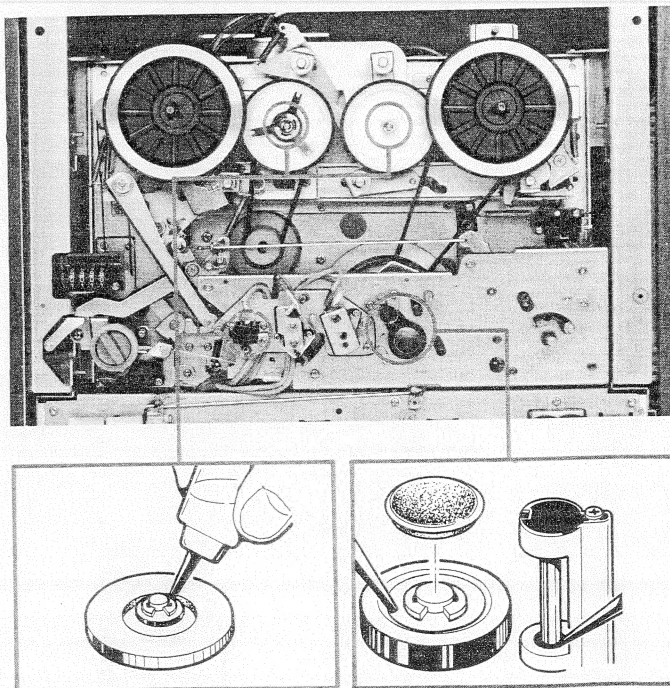
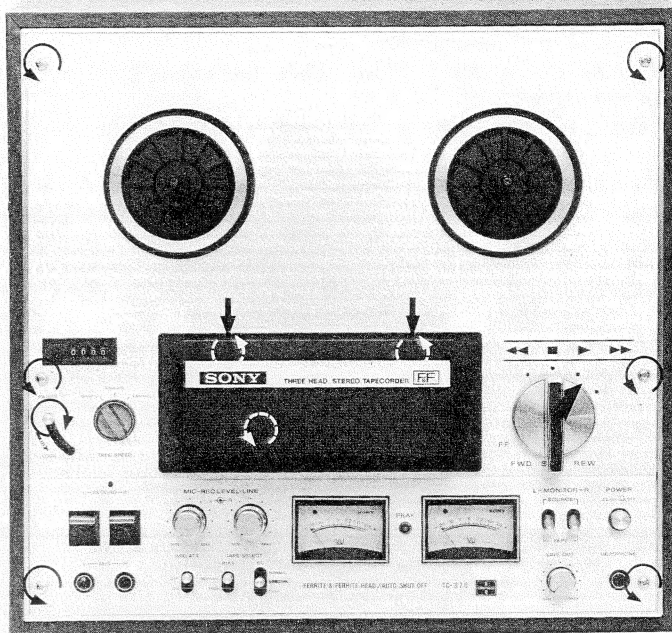
Lubrication

To maintain the optimum performance of the recorder, consult your nearest Sony dealer or service personnel, once a year, for lubrication and inside check.

CAUTION: BEFORE PROCEEDING, DISCONNECT THE AC POWER CORD.

Use light machine oil. Avoid excessive lubrication.

Remove the top panel and take out the cap of the pinch roller. Apply one drop of oil to the pinch roller shaft, capstan and idler shafts. Wipe off all excessive oil.



Frequency adaptation (Type 2 only)

Replace the motor pulley with the supplied one and change the tapping of the terminals.

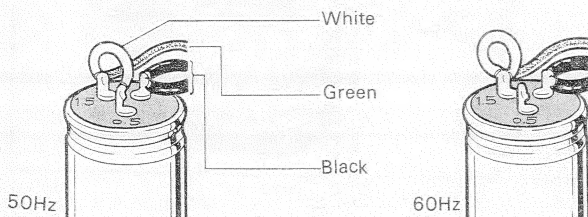
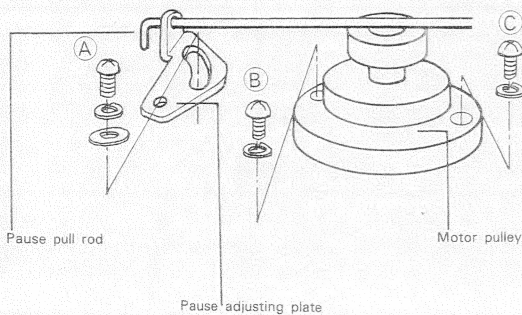
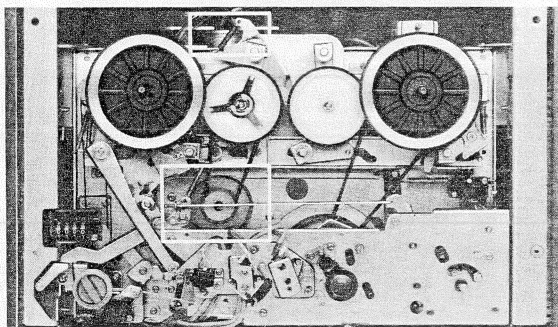
To change motor pulley

The motor pulley is located near the center of the drive mechanism.

1. Remove the pause adjusting plate by loosening the screw ①. Withdraw the pause pull rod.
2. Remove the rubber belt from the motor pulley and the idler wheel.
3. Remove the motor pulley by loosening the two screws ② and ③ which hold the motor pulley.
4. Substitute the supplied motor pulley for the original and tighten the screws.
5. Thread the rubber belt on the motor pulley and the idler wheel.
6. Adjust the screw ① so that the clearance between the pinch roller and capstan is approx. 1 mm (1/32 inch) when pulling the pause lever in forward mode. And the pause lever is not locked when pulling in stop, fast forward and rewind modes.

To change the tapping of the motor capacitor terminals

The motor capacitor is located at the upper side of the drive mechanism. Take off the cap and change the tapping by soldering as illustrated.



EDITING

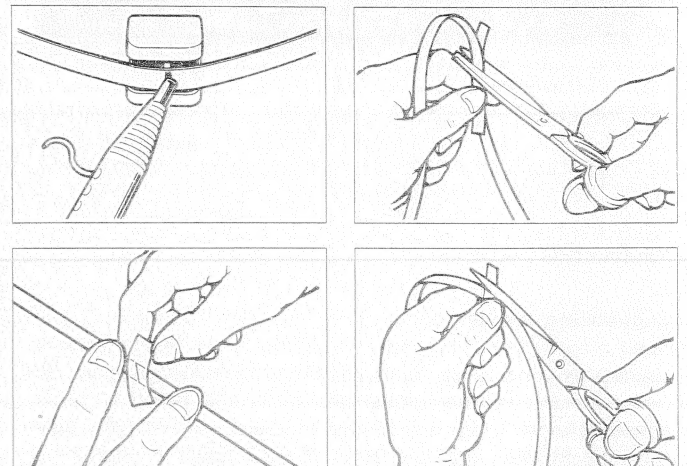
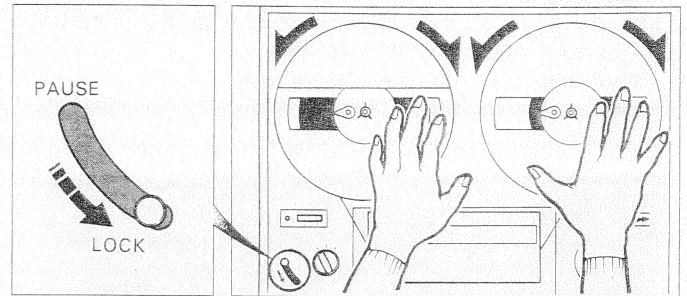
There are two ways of tape editing: editing by tape duplication and by splicing. Before editing, play the original tape thoroughly, and note the tape counter number where the unwanted sounds (narration or commercials, pop noise, etc.) are located. Then go back and proceed with editing in either way.

Editing by Duplication

For connection, see page 4.

If one recorder is inferior to the other in quality, use the better one as a master recorder for the playback process, to obtain better S/N.

Editing by Splicing



Cueing

1. Stop the tape with the PAUSE lever in playback mode at the portion to be spliced.
2. Move the tape across the playback head back and forth by turning both reels by hand.
3. While listening to cue sound, find the correct portion to be spliced, and carefully mark it at the position of the playback head on the outer side of the tape with soft colored pencil. Yellow will be most distinctive.

Note: Take care not to get excessive marking material on the heads. Any stain on the heads will cause contamination and impair tape-and-head contact.

Splicing

Use splicing tape and a demagnetized pair of scissors.

1. Neatly overlap the tapes to be spliced and cut diagonally.
2. Place the two diagonal tape ends together, outer side up, on a flat surface. Be careful to make ends meet but not overlap.
3. Apply a piece of splicing tape diagonally over the aligned ends, and press it firmly.
4. Trim off the excessive splicing tape, slightly cutting into the tape.

Note: Do not use ordinary cellophane tape as it tends to spoil recording tapes. Also avoid using magnetized scissors or razor blades. Magnetized instruments will cause a "click" or "pop" at the spliced portion.

Take care not to unnecessarily touch the tape. Even invisible traces of grease and sweat from your fingers will hinder a good sticking.

TROUBLE CHECKS

The following chart will help correct any trouble which could occur with the recorder. If the trouble persists after you have made these checks, consult your Sony dealer.

The function selector does not move.

- Thread the tape without slack.

No sound during playback

- Set the MONITOR selectors at TAPE.
- Check amplifier input setting.
- Check amplifier volume control.

Unclear or distorted record or excessive wow and flutter

- Clean heads and tape path.
- Check if the reels are warped.

Severe hum or noise

- Use shielded connecting cables.
- Ensure that cables are not near transformers, generators or ac power cord.

Too low microphone sound

- Check microphone impedance.
- Set the MIC ATT switch at "OFF".

Oscillation occurs from the connected speaker when trying to record.

- The input selector on the amplifier should be set according to the source being recorded.

If the amplifier input selector is set at AUX when recorder LINE OUT jacks and the amplifier AUX input jacks are connected, oscillation may occur.

- Keep the microphone away from the speaker or reduce the volume of the amplifier.

PRINCIPAL FEATURES

- Peak level indicator which responds in recording to transient over-level signals.
- High performance F&F (Ferrite and Ferrite) heads.
- Tape bias and equalization switches to obtain the maximum characteristics according to the type of tapes; newly-issued Sony Ferri-Chrome Tape, Sony SLH tape and regular tape.
- Tape tension regulator to reduce wow and flutter.

SYM PHASE Emblem

The designation "SYM PHASE" symbolizes the parallel head gap of the F&F heads, which prevents phase shifts during recording or reproduction of original source materials.

SPECIFICATIONS

Power requirements	Type 1 (European model): 110, 127, 220 or 240 V ac~ 50 Hz Type 2 (Post Exchange model): 100, 110, 120, 127, 220 or 240 V ac~ 50 or 60 Hz
Power consumption	Type 1: 48 W Type 2: 28 W
Semiconductors	27 transistors 7 diodes, 1 LED
Tape speeds	7 1/2 ips (19 cm/s), 3 3/4 ips (9.5 cm/s) 17 1/8 ips (4.8 cm/s)
Recording time	3 hours total at 3 3/4 ips, stereo recording with 550 m tape (7-inch reel)
Fast winding time	Approx. 2 min. with 370 m tape
Reels	7 inches or smaller
Track system	4-track 2-channel stereo
Heads	Record head 1, playback head 1 erase head 1
Bias frequency	160 kHz
Equalization	NAB standard
Signal-to-noise ratio	With Sony Ferri-Chrome Tape 58 dB (DIN) 61 dB (NAB)
Total harmonic distortion	0.8 %
Frequency response	With Sony Ferri-Chrome Tape 30 - 27,000 Hz at 7 1/2 ips (DIN) 40 - 18,000 Hz at 3 3/4 ips (DIN) 20 - 35,000 Hz at 7 1/2 ips (NAB) 30 - 30,000 Hz \pm 3 dB at 7 1/2 ips (NAB) 20 - 23,000 Hz at 3 3/4 (NAB) With SLH tape 30 - 24,000 Hz at 7 1/2 ips (DIN) 40 - 16,000 Hz at 3 3/4 ips (DIN) 20 - 30,000 Hz at 7 1/2 ips (NAB) 30 - 25,000 Hz \pm 3 dB at 7 1/2 ips (NAB) 20 - 20,000 Hz at 3 3/4 ips (NAB) With regular tape 30 - 20,000 Hz at 7 1/2 ips (DIN) 40 - 13,000 Hz at 3 3/4 ips (DIN) 20 - 25,000 Hz at 7 1/2 ips (NAB) 30 - 20,000 Hz \pm 3 dB at 7 1/2 ips (NAB) 20 - 17,000 Hz at 3 3/4 ips (NAB)
Wow and flutter	\pm 0.09% at 7 1/2 ips (DIN) \pm 0.12% at 3 3/4 ips (DIN) 0.09% WRMS at 7 1/2 ips (NAB) 0.12% WRMS at 3 3/4 ips (NAB) 0.17% WRMS at 17 1/8 ips (NAB)
Inputs	Microphone inputs 2 sensitivity 0.2 mV (-72 dB) for low impedance microphone Line inputs. 2 sensitivity 0.06 V (-22 dB) input impedance 100 k ohms Line outputs. 2 output level 0.775 V (0 dB) at load impedance of 100 k ohms, with LINE OUT level controls set to MAX. Suitable load impedance 10 k ohms or higher Headphone output 1 suitable load impedance 8 ohms
Outputs	
Record/playback (DIN) connector	Input impedance less than 10 k ohms Output impedance less than 10 k ohms
Dimensions	Approx. 165/8 \times 153/4 \times 7 inches (w/h/d) 420 \times 400 \times 175 mm Including projecting parts and controls
Weight	Approx. 26 lb 6 oz (12 kg)
Supplied accessories	7-inch reel 1 Connecting cord RK-74H 2 Head cleaning tip 1 set Motor pulley (Type 2) 1
Design and specifications are subject to change without notice.	